

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 643802

Proj.
ECN

2. ECN Category (mark one) Supplemental <input type="checkbox"/> Direct Revision <input checked="" type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Standby <input type="checkbox"/> Supersedure <input type="checkbox"/> Cancel/Void <input type="checkbox"/>		3. Originator's Name, Organization, MSIN, and Telephone No. Brett C. Simpson, Data Assessment and Interpretation, R2-12, 373-5915		4. USQ Required? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		5. Date 07/13/98	
		6. Project Title/No./Work Order No. Tanks 241-T-201, 241-T-202, 241-T-203, 241-T-204		7. Bldg./Sys./Fac. No. 241-T-201, 241-T-202, 241-T-203, 241-T-204		8. Approval Designator N/A	
		9. Document Numbers Changed by this ECN (includes sheet no. and rev.) HNF-1501, Rev. 0		10. Related ECN No(s). N/A		11. Related PO No. N/A	
12a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 12b) <input checked="" type="checkbox"/> No (NA Blks. 12b, 12c, 12d)		12b. Work Package No. N/A		12c. Modification Work Complete N/A <hr/> Design Authority/Cog. Engineer Signature & Date		12d. Restored to Original Condition (Temp. or Standby ECN only) N/A <hr/> Design Authority/Cog. Engineer Signature & Date	
13a. Description of Change Revisions were made to Section 3 and Appendix D, Evaluation to Establish Best-Basis Inventory for the T-200 Series Single-Shell Tanks. Changes were made to both text and tables. The reconciliation process involved correction of errata, reassessment of data outliers, computation and allocation of uranium isotopes and other alpha emitters, and removal of "less than" values.							
13b. Design Baseline Document? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No							
14a. Justification (mark one) Criteria Change <input checked="" type="checkbox"/> Design Improvement <input type="checkbox"/> Environmental <input type="checkbox"/> Facility Deactivation <input type="checkbox"/> As-Found <input type="checkbox"/> Facilitate Const <input type="checkbox"/> Const. Error/Omission <input type="checkbox"/> Design Error/Omission <input type="checkbox"/>							
14b. Justification Details Tank waste inventory estimates are being provided as standard source terms for various waste management activities. FY 1997 evaluation of available information for all 177 underground storage tanks was performed and published. In FY 1998, a reconciliation process is being performed to update the best basis inventories. This process ensures that the latest inventory estimates are available as a consistent source term.							
15. Distribution (include name, MSIN, and no. of copies) See attached distribution.						RELEASE STAMP DATE: STA: 4 JUL 14 1998 HANFORD RELEASE ID: 2	

ENGINEERING CHANGE NOTICE

Page 2 of 2

1. ECN (use no. from pg. 1)

ECN-643802

16. Design Verification Required <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	17. Cost Impact				18. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
	Additional <input type="checkbox"/> \$	Additional <input type="checkbox"/> \$			Improvement <input type="checkbox"/>	
	Savings <input type="checkbox"/> \$	Savings <input type="checkbox"/> \$			Delay <input type="checkbox"/>	

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20:

SDD/DD <input type="checkbox"/>	Seismic/Stress Analysis <input type="checkbox"/>	Tank Calibration Manual <input type="checkbox"/>
Functional Design Criteria <input type="checkbox"/>	Stress/Design Report <input type="checkbox"/>	Health Physics Procedure <input type="checkbox"/>
Operating Specification <input type="checkbox"/>	Interface Control Drawing <input type="checkbox"/>	Spares Multiple Unit Listing <input type="checkbox"/>
Criticality Specification <input type="checkbox"/>	Calibration Procedure <input type="checkbox"/>	Test Procedures/Specification <input type="checkbox"/>
Conceptual Design Report <input type="checkbox"/>	Installation Procedure <input type="checkbox"/>	Component Index <input type="checkbox"/>
Equipment Spec. <input type="checkbox"/>	Maintenance Procedure <input type="checkbox"/>	ASME Coded Item <input type="checkbox"/>
Const. Spec. <input type="checkbox"/>	Engineering Procedure <input type="checkbox"/>	Human Factor Consideration <input type="checkbox"/>
Procurement Spec. <input type="checkbox"/>	Operating Instruction <input type="checkbox"/>	Computer Software <input type="checkbox"/>
Vendor Information <input type="checkbox"/>	Operating Procedure <input type="checkbox"/>	Electric Circuit Schedule <input type="checkbox"/>
OM Manual <input type="checkbox"/>	Operational Safety Requirement <input type="checkbox"/>	ICRS Procedure <input type="checkbox"/>
FSAR/SAR <input type="checkbox"/>	IEFD Drawing <input type="checkbox"/>	Process Control Manual/Plan <input type="checkbox"/>
Safety Equipment List <input type="checkbox"/>	Cell Arrangement Drawing <input type="checkbox"/>	Process Flow Chart <input type="checkbox"/>
Radiation Work Permit <input type="checkbox"/>	Essential Material Specification <input type="checkbox"/>	Purchase Requisition <input type="checkbox"/>
Environmental Impact Statement <input type="checkbox"/>	Fac. Proc. Samp. Schedule <input type="checkbox"/>	Tickler File <input type="checkbox"/>
Environmental Report <input type="checkbox"/>	Inspection Plan <input type="checkbox"/>	
Environmental Permit <input type="checkbox"/>	Inventory Adjustment Request <input type="checkbox"/>	

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision

Document Number/Revision

Document Number Revision

N/A

21. Approvals

Signature	Date	Signature	Date
Design Authority		Design Agent	
Cog. Eng. B.C. Simpson <i>B.C. Simpson</i>	<u>7-13-98</u>	PE	
Cog. Mgr. K.M. Hall <i>Kathleen M. Hall</i>	<u>7-14-98</u>	QA	
QA		Safety	
Safety		Design	
Environ.		Environ.	
Other J.W. Cammann <i>JW Cammann</i>	<u>7/14/98</u>	Other	
K.M. Hodgson <i>K.M. Hodgson</i>	<u>7-14-98</u>		
		DEPARTMENT OF ENERGY	
		Signature or a Control Number that tracks the Approval Signature	
		ADDITIONAL	

Tank Characterization Report for Single-Shell Tanks 241-T-201, 241-T-202, 241-T-203, and 241-T-204

Brett C. Simpson
Lockheed Martin Hanford Corp., Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

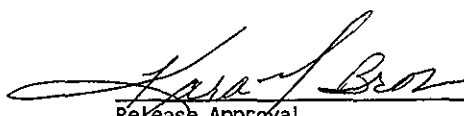
EDT/ECN: ECN-643802 UC: 2070
Org Code: 74620 Charge Code: N4G4C
B&R Code: EW 3120074 Total Pages: 308

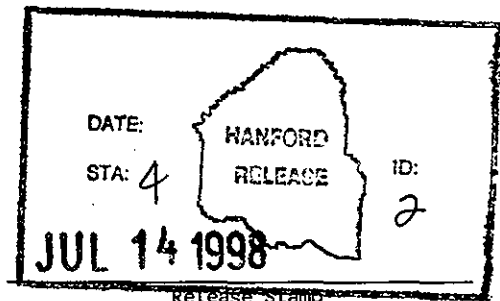
Key Words: Waste Characterization, Single-Shell Tank, SST, Tank 241-T-201, Tank T-201, T-201, Tank 241-T-202, Tank T-202, T-202, Tank 241-T-203, Tank T-203, T-203, Tank 241-T-204, Tank T-204, T-204, T Farm, Tank Characterization Report, TCR, Waste Inventory, TPA Milestone M-44, Best Basis Inventories, Best Basis

Abstract: This document summarizes the information on the historical uses, present status, and the sampling and analysis results of waste stored in Tanks 241-T-201, 241-T-202, 241-T-203, and 241-T-204. This report supports the requirements of the Tri-Party Agreement Milestone M-44-15B.

TRADEMARK DISCLAIMER. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

Printed in the United States of America. To obtain copies of this document, contact: WHC/BCS Document Control Services, P.O. Box 1970, Mailstop H6-08, Richland WA 99352, Phone (509) 372-2420; Fax (509) 376-4989.


Release Approval
7/14/98
Date



Approved for Public Release

3.0 BEST-BASIS STANDARD INVENTORY ESTIMATE

Information about the chemical and/or physical properties of tank wastes is used to perform safety analyses, engineering evaluations, and risk assessments associated with waste management activities, as well as to address regulatory issues. Waste management activities include overseeing tank farm operations and identifying, monitoring, and resolving safety issues associated with these operations and with the tank wastes. Disposal activities involve designing equipment, processes, and facilities for retrieving wastes and processing the wastes into a form that is suitable for long-term storage.

Chemical inventory information generally is derived using three approaches: 1) component inventories are estimated using the results of sample analyses; 2) component inventories are calculated using process knowledge and analytical information derived from related tanks; and 3) component inventories are predicted using a model based on process knowledge and historical information. The most recent model was developed by Los Alamos National Laboratory (LANL) (Agnew et al. 1997). Information derived from these different approaches is inconsistent.

An effort is underway to provide waste inventory estimates that will serve as standard characterization information for the various waste management activities (Hodgson and LeClair 1996). Appendix D contains the complete narrative regarding the derivation of the inventory estimates presented in Tables 3-1 and 3-2.

Table 3-1. Best-Basis Inventory Estimates for Nonradioactive Components in T-200 Series Tanks (Effective May 31, 1997). (2 sheets)

Analyte	Total Inventory (kg)				Basis (S, M, C or E) ¹	Comment
	T-201	T-202	T-203	T-204		
Al	14.0	7.12	9.17	9.33	S	
Bi	16,600	4,040	7,940	8,960	S	
Ca	173	30.6	56.4	35.9	S	
Cl	151	68.3	107	117	S	
TIC as CO ₃	564	1,025	1,290	1,220	S	
Cr	746	371	618	781	S	
F	708	647	1,030	1,030	S	
Fe	1,380	751	1,110	703	S	
Hg	0	0	0	0	E	Simpson (1998a)
K	671	704	1,120	1,070	S	

Table 3-1. Best-Basis Inventory Estimates for Nonradioactive Components in T-200 Series Tanks (Effective May 31, 1997). (2 sheets)

Analyte	Total Inventory (kg)				Basis (S, M, C or E) ¹	Comment
	T-201	T-202	T-203	T-204		
La	3,470	1,240	1,910	2,000	S	
Mn	6,180	1,460	2,620	2,450	S	
Na	4,500	3,540	5,670	5,530	S	
Ni	87.8	13.0	24.1	42.0	S	
NO ₂	43.8	51.7	48.1	49.4	S	
NO ₃	6,730	6,470	10,500	9,610	S	
OH	14,600	3,640	6,690	6,640	C	
Pb	29.6	5.72	3.39	54.0	S	
PO ₄	1,940	721	1,190	1,310	S	
Si	259	184	261	261	S	
SO ₄	38.6	109	71.4	63.2	S	
Sr	156	50.0	90.8	87.0	S	
TOC	42.4	34.2	68.4	54.3	S	
U _{TOTAL}	8.13	10.1	10.2	11.0	M, S, M, M	Simpson (1998b)
Zr	0	0.2	0	0	S	

Notes:

¹S = Sample-based (see Appendix B)

M = Hanford Defined Waste model-based

E = Engineering assessment-based

C = Calculated by charge balance; includes oxides as hydroxides, not including CO₃, NO₂, NO₃, PO₄, SO₄, and SiO₃.

Table 3-2. Best-Basis Inventory Estimate for Radioactive Components in T-200 Series Tanks Decayed to January 1, 1994 (Effective May 31, 1997). (3 Sheets)

Analyte	Total Inventory (Ci)				Basis (S, M or E) ¹	Comment
	T-201	T-202	T-203	T-204		
³ H	2.86E+00	2.02E+00	3.34E+00	3.57E+00	E	Based on B-201
¹⁴ C	4.41E-02	3.11E-02	5.15E-02	5.50E-02	E	Based on B-201
⁵⁹ Ni	9.56E-04	6.76E-04	1.12E-03	1.19E-03	E	Based on B-201
⁶⁰ Co	2.73E-01	1.93E-01	3.19E-01	3.41E-01	E	Based on B-201
⁶³ Ni	2.62E-02	1.85E-02	3.06E-02	3.27E-02	E	Based on B-201

Table 3-2. Best-Basis Inventory Estimate for Radioactive Components in T-200 Series Tanks
Decayed to January 1, 1994 (Effective May 31, 1997). (3 Sheets)

Analyte	Total Inventory (Ci)				Basis (S, M or E) ¹	Comment
	T-201	T-202	T-203	T-204		
⁷⁹ Se	3.68E-05	2.76E-05	4.60E-05	5.00E-05	M	
⁹⁰ Sr	2.17E+01	2.70E-01	4.61E-01	8.82E-01	S	
⁹⁰ Y	2.17E+01	2.70E-01	4.61E-01	8.82E-01	S	Based on ⁹⁰ Sr
^{93m} Nb	1.45E-04	1.08E-04	1.81E-04	1.96E-04	M	
⁹³ Zr	1.75E-04	1.31E-04	2.18E-04	2.37E-04	M	
⁹⁹ Tc	1.21E-03	9.09E-04	1.51E-03	1.64E-03	M	
¹⁰⁶ Ru	4.20E-11	3.15E-11	5.25E-11	5.70E-11	M	
^{113m} Cd	4.89E-04	3.67E-04	6.12E-04	6.64E-04	M	
¹²⁵ Sb	6.46E-05	4.84E-05	8.07E-05	8.77E-05	M	
¹²⁶ Sn	5.55E-05	4.16E-05	6.94E-05	7.53E-05	M	
¹²⁹ I	2.29E-06	1.72E-06	2.86E-06	3.10E-06	M	
¹³⁴ Cs	3.32E-01	2.35E-01	3.88E-01	4.14E-01	E	Based on B-201
^{137m} Ba	6.60E+00	2.88E+00	3.05E+00	1.40E+00	S	Based on ¹³⁷ Cs
¹³⁷ Cs	6.98E+00	3.04E+00	3.22E+00	1.48E+00	S	
¹⁵¹ Sm	0.139	0.104	0.174	0.189	M	
¹⁵² Eu	1.82E-04	1.37E-04	2.28E-04	2.47E-04	M	
¹⁵⁴ Eu	6.11E-01	4.32E-01	7.14E-01	7.62E-01	E	Based on B-201
¹⁵⁵ Eu	4.57E-01	3.23E-01	5.34E-01	5.71E-01	E	Based on B-201
²²⁶ Ra	8.22E-09	6.16E-09	1.03E-08	1.12E-08	M	
²²⁷ Ac	4.34E-08	3.25E-08	5.42E-08	5.89E-08	M	
²²⁸ Ra	5.28E-13	3.96E-13	6.61E-13	7.17E-13	M	
²²⁹ Th	1.02E-10	7.67E-11	1.28E-10	1.39E-10	M	
²³¹ Pa	1.00E-07	7.51E-08	1.25E-07	1.36E-07	M	
²³² Th	4.62E-14	3.46E-14	5.77E-14	6.27E-14	M	
²³² U	5.36E-08	6.66E-08	6.73E-08	7.25E-08	S/M	Simpson (1998b)
²³³ U	2.45E-09	3.04E-09	3.07E-09	3.31E-09	S/M	Simpson (1998b)
²³⁴ U	2.67E-03	3.32E-03	3.35E-03	3.62E-03	S/M	Simpson (1998b)
²³⁵ U	1.19E-04	1.48E-04	1.49E-04	1.61E-04	S/M	Simpson (1998b)
²³⁶ U	2.33E-05	2.90E-05	2.92E-05	3.15E-05	S/M	Simpson (1998b)
²³⁷ Np	7.51E-06	5.36E-06	9.39E-06	1.02E-05	M	
²³⁸ Pu	4.85E-01	3.43E-01	5.67E-01	6.06E-01	E	Based on B-201
²³⁸ U	2.71E-03	3.37E-03	3.41E-03	3.67E-03	S/M	Simpson (1998b)

Table 3-2. Best-Basis Inventory Estimate for Radioactive Components in T-200 Series Tanks
Decayed to January 1, 1994 (Effective May 31, 1997). (3 Sheets)

Analyte	Total Inventory (Ci)				Basis (S, M or E) ¹	Comment
	T-201	T-202	T-203	T-204		
²³⁹ Pu	9.28E+01	1.69E+01	2.66E+01	1.98E+01	S/M	Simpson (1998b)
²⁴⁰ Pu	8.14E+00	1.48E+00	2.33E+00	1.74E+00	S/M	Simpson (1998b)
²⁴¹ Am	4.32E+00	3.06E+00	5.85E+00	4.25E+00	E, E, S, S	"E" based on B-201
²⁴¹ Pu	2.69E+01	4.91E+00	7.71E+00	5.75E+00	S/M	Simpson (1998b)
²⁴² Cm	4.22E-02	2.99E-02	5.71E-02	4.15E-02	M/E, M/E, S/M, S/M	Simpson (1998b)
²⁴² Pu	1.24E-04	2.27E-05	3.57E-05	2.66E-05	S/M	Simpson (1998b)
²⁴³ Am	3.51E-05	2.49E-05	4.75E-05	3.45E-05	M/E, M/E, S/M, S/M	Simpson (1998b)
²⁴³ Cm	9.08E-04	6.43E-04	1.23E-03	8.94E-04	M/E, M/E, S/M, S/M	Simpson (1998b)
²⁴⁴ Cm	8.92E-04	6.32E-04	1.21E-03	8.78E-04	M/E, M/E, S/M, S/M	Simpson (1998b)

¹S=Sample-based

M=Hanford Defined Waste model-based

E=Engineering assessment-based

- Hodgson, K. M., and M. D. LeClair, 1996, *Work Plan for Defining a Standard Inventory Estimate for Wastes Stored in Hanford Site Underground Tanks*, WHC-SD-WM-WP-311, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- Hu, T. A., 1997, *Tank 241-T-201 Push Mode Core Sampling and Analysis Plan*, HNF-SD-WM-TSAP-130, Rev. 0, Lockheed Martin Hanford Corporation, Richland, Washington.
- Nuzum, J. L. , 1997a, *Tank 241-T-201, Core 192, Analytical Results for the Final Report*, HNF-SD-WM-DP-254, Rev. 0, Waste Management of Hanford Inc., Richland, Washington.
- Nuzum, J. L. , 1997b, *Tank 241-T-204, Core 188, Analytical Results for the Final Report*, HNF-SD-WM-DP-255, Rev. 0, Waste Management of Hanford Inc., Richland, Washington.
- Osborne, J. W. and L. L. Buckley, 1995, *Data Quality Objectives for Tank Hazardous Vapor Safety Screening*, WHC-SD-WM-DQO-002, Rev. 2, Westinghouse Hanford Company, Richland, Washington.
- Public Law 101-510, 1990, "Safety Measures for Waste Tanks at Hanford Nuclear Reservation," Section 3137 of *National Defense Authorization Act for Fiscal Year 1991*.
- Schreiber, R. D., 1997a, *Tank 241-T-203 Push Mode Core Sampling and Analysis Plan*, WHC-SD-WM-TSAP-118, Rev. 0A, Lockheed Martin Hanford Corporation, Richland, Washington.
- Schreiber, R. D., 1997b, *Memorandum of Understanding for the Organic Complexant Issue Data Requirements*, HNF-SD-WM-RD-060, Rev. 0, Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.
- Schreiber, R. D. 1997c, "Meeting Minutes, Tank Data Review Committee," September 22, Lockheed Martin Hanford Corporation for Fluor Daniel Hanford Inc., Richland, Washington.
- Simpson, B. C., 1998a, *Best-Basis Inventory Change Package for Reconciliation of Mercury Values, Change Package #7*, (letter 7A120-98-005 to J. W. Cammann, February 26), Lockheed Martin Hanford Corporation, Richland, Washington.
- Simpson, B. C., 1998b, *Best-Basis Inventory Change Package for Reconciliation of Uranium and Other Alpha Emitters, Change Package #11*, (letter 7A120-98-024 to J. W. Cammann, June 9), Lockheed Martin Hanford Corporation, Richland, Washington.
-

radionuclides by computer models. These models estimate radionuclide activity in batches of reactor fuel, account for the split of radionuclides to various separations plant waste streams, and track their movement with tank waste transactions. (These computer models are described in Kupfer et al. 1997, Section 6.1 and in Watrous and Wootan 1997.) Model generated values for radionuclides in any of 177 tanks are reported in the HDW Rev. 4 model results (Agnew et al. 1997a). The best-basis value for any one analyte may be either a model result or a sample or engineering assessment-based result if available. For a discussion of typical error between model derived values and sample derived values, see Kupfer et al. 1997, Section 6.1.10. The radionuclide inventories shown in Table D4-1 are based primarily on Agnew et al. (1997a) HDW model estimates for the T-200 series tanks.

Table D4-1. Best-Basis Inventory Estimates for Nonradioactive Components in T-200 Series Tanks (Effective May 31, 1997). (2 sheets)

Analyte	Total Inventory (kg)				Basis (S, M, C or E) ¹	Comment
	T-201	T-202	T-203	T-204		
Al	14.0	7.12	9.17	9.33	S	
Bi	16,600	4,040	7,940	8,960	S	
Ca	173	30.6	56.4	35.9	S	
Cl	151	68.3	107	117	S	
TIC as CO ₃	564	1,025	1,290	1,220	S	
Cr	746	371	618	781	S	
F	708	647	1,030	1,030	S	
Fe	1,380	751	1,110	703	S	
Hg	0	0	0	0	E	Simpson (1998a)
K	671	704	1,120	1,070	S	
La	3,470	1,240	1,910	2,000	S	
Mn	6,180	1,460	2,620	2,450	S	
Na	4,500	3,540	5,670	5,530	S	
Ni	87.8	13.0	24.1	42.0	S	
NO ₂	43.8	51.7	48.1	49.4	S	
NO ₃	6,730	6,470	10,500	9,610	S	
OH	14,600	3,640	6,690	6,640	C	
Pb	29.6	5.72	3.39	54.0	S	
PO ₄	1,940	721	1,190	1,310	S	

Table D4-1. Best-Basis Inventory Estimates for Nonradioactive Components in T-200 Series Tanks (Effective May 31, 1997). (2 sheets)

Analyte	Total Inventory (kg)				Basis (S, M, C or E) ¹	Comment
	T-201	T-202	T-203	T-204		
Si	259	184	261	261	S	
SO ₄	38.6	109	71.4	63.2	S	
Sr	156	50.0	90.8	87.0	S	
TOC	42.4	34.2	68.4	54.3	S	
U _{TOTAL}	8.13	10.1	10.2	11.0	M, S, M, M	(Simpson 1998b)
Zr	0	0.2	0	0	S	

Notes:

¹S = Sample-based (see Appendix B)

M = Hanford Defined Waste model-based

E = Engineering assessment-based

C = Calculated by charge balance; includes oxides as hydroxides, not including CO₃, NO₂, NO₃, PO₄, SO₄, and SiO₃.

Table D4-2. Best-Basis Inventory Estimate for Radioactive Components in T-200 Series Tanks Decayed to January 1, 1994 (Effective May 31, 1997). (3 Sheets)

Analyte	Total Inventory (Ci)				Basis (S, M or E) ¹	Comment
	T-201	T-202	T-203	T-204		
³ H	2.86E+00	2.02E+00	3.34E+00	3.57E+00	E	Based on B-201
¹⁴ C	4.41E-02	3.11E-02	5.15E-02	5.50E-02	E	Based on B-201
⁵⁹ Ni	9.56E-04	6.76E-04	1.12E-03	1.19E-03	E	Based on B-201
⁶⁰ Co	2.73E-01	1.93E-01	3.19E-01	3.41E-01	E	Based on B-201
⁶³ Ni	2.62E-02	1.85E-02	3.06E-02	3.27E-02	E	Based on B-201
⁷⁹ Se	3.68E-05	2.76E-05	4.60E-05	5.00E-05	M	
⁹⁰ Sr	2.17E+01	2.70E-01	4.61E-01	8.82E-01	S	
⁹⁰ Y	2.17E+01	2.70E-01	4.61E-01	8.82E-01	S	Based on ⁹⁰ Sr
^{93m} Nb	1.45E-04	1.08E-04	1.81E-04	1.96E-04	M	
⁹³ Zr	1.75E-04	1.31E-04	2.18E-04	2.37E-04	M	
⁹⁹ Tc	1.21E-03	9.09E-04	1.51E-03	1.64E-03	M	
¹⁰⁶ Ru	4.20E-11	3.15E-11	5.25E-11	5.70E-11	M	
^{113m} Cd	4.89E-04	3.67E-04	6.12E-04	6.64E-04	M	
¹²⁵ Sb	6.46E-05	4.84E-05	8.07E-05	8.77E-05	M	

Table D4-2. Best-Basis Inventory Estimate for Radioactive Components in T-200 Series Tanks
Decayed to January 1, 1994 (Effective May 31, 1997). (3 Sheets)

Analyte	Total Inventory (Ci)				Basis (S, M or E) ¹	Comment
	T-201	T-202	T-203	T-204		
¹²⁶ Sn	5.55E-05	4.16E-05	6.94E-05	7.53E-05	M	
¹²⁹ I	2.29E-06	1.72E-06	2.86E-06	3.10E-06	M	
¹³⁴ Cs	3.32E-01	2.35E-01	3.88E-01	4.14E-01	E	Based on B-201
^{137m} Ba	6.60E+00	2.88E+00	3.05E+00	1.40E+00	S	Based on ¹³⁷ Cs
¹³⁷ Cs	6.98E+00	3.04E+00	3.22E+00	1.48E+00	S	
¹⁵¹ Sm	0.139	0.104	0.174	0.189	M	
¹⁵² Eu	1.82E-04	1.37E-04	2.28E-04	2.47E-04	M	
¹⁵⁴ Eu	6.11E-01	4.32E-01	7.14E-01	7.62E-01	E	Based on B-201
¹⁵⁵ Eu	4.57E-01	3.23E-01	5.34E-01	5.71E-01	E	Based on B-201
²²⁶ Ra	8.22E-09	6.16E-09	1.03E-08	1.12E-08	M	
²²⁷ Ac	4.34E-08	3.25E-08	5.42E-08	5.89E-08	M	
²²⁸ Ra	5.28E-13	3.96E-13	6.61E-13	7.17E-13	M	
²²⁹ Th	1.02E-10	7.67E-11	1.28E-10	1.39E-10	M	
²³¹ Pa	1.00E-07	7.51E-08	1.25E-07	1.36E-07	M	
²³² Th	4.62E-14	3.46E-14	5.77E-14	6.27E-14	M	
²³² U	5.36E-08	6.66E-08	6.73E-08	7.25E-08	S/M	Simpson (1998b)
²³³ U	2.45E-09	3.04E-09	3.07E-09	3.31E-09	S/M	Simpson (1998b)
²³⁴ U	2.67E-03	3.32E-03	3.35E-03	3.62E-03	S/M	Simpson (1998b)
²³⁵ U	1.19E-04	1.48E-04	1.49E-04	1.61E-04	S/M	Simpson (1998b)
²³⁶ U	2.33E-05	2.90E-05	2.92E-05	3.15E-05	S/M	Simpson (1998b)
²³⁷ Np	7.51E-06	5.36E-06	9.39E-06	1.02E-05	M	
²³⁸ Pu	4.85E-01	3.43E-01	5.67E-01	6.06E-01	E	Based on B-201
²³⁸ U	2.71E-03	3.37E-03	3.41E-03	3.67E-03	M/E	Simpson (1998b)
²³⁹ Pu	9.28E+01	1.69E+01	2.66E+01	1.98E+01	M/E	Simpson (1998b)
²⁴⁰ Pu	8.14E+00	1.48E+00	2.33E+00	1.74E+00	M/E	Simpson (1998b)
²⁴¹ Am	4.32E+00	3.06E+00	5.85E+00	4.25E+00	E, E, S, S	"E" based on B-201
²⁴¹ Pu	2.69E+01	4.91E+00	7.71E+00	5.75E+00	M/E	Simpson (1998b)
²⁴² Cm	4.22E-02	2.99E-02	5.71E-02	4.15E-02	M/E, M/E, S/M, S/M	Simpson (1998b)
²⁴² Pu	1.24E-04	2.27E-05	3.57E-05	2.66E-05	M/E	Simpson (1998b)
²⁴³ Am	3.51E-05	2.49E-05	4.75E-05	3.45E-05	M/E, M/E, S/M, S/M	Simpson (1998b)
²⁴³ Cm	9.08E-04	6.43E-04	1.23E-03	8.94E-04	M/E, M/E, S/M, S/M	Simpson (1998b)
²⁴⁴ Cm	8.92E-04	6.32E-04	1.21E-03	8.78E-04	M/E, M/E, S/M, S/M	Simpson (1998b)

Simpson, B. C., 1998b, *Best-Basis Inventory Change Package for Reconciliation of Uranium and Other Alpha Emitters, Change Package #11*, (letter 7A120-98-024 to J. W. Cammann, June 9), Lockheed Martin Hanford Corporation, Richland, Washington.

Steen, F. H. , 1997, *Tank 241-T-203, Core 190, Analytical Results for the Final Report*, HNF-SD-WM-DP-247, Rev. 0, Waste Management of Hanford Inc., Richland, Washington.

Watrous, R. A., and D. W. Wootan, 1997, *Activity of Fuel Batches Processed Through Hanford Separations Plants, 1944 Through 1989*, HNF-SD-WM-TI-794, Rev. 0, Lockheed Martin Hanford Corporation, Richland, Washington.

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 646000

Proj.
ECN

2. ECN Category (mark one) Supplemental <input type="checkbox"/> Direct Revision <input checked="" type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Standby <input type="checkbox"/> Supersedeure <input type="checkbox"/> Cancel/Void <input type="checkbox"/>	3. Originator's Name, Organization, MSIN, and Telephone No. K.E. Smith, SNF Storage Projects, R3-86, 376-0273	4. USQ Required? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. Date July 13, 1998
	6. Project Title/No./Work Order No. Multi-Canister Overpack, W-442	7. Bldg./Sys./Fac. No. 212H	8. Approval Designator Q
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) HNF-S-0453, Rev. 2L	10. Related ECN No(s). 645976, 645986, 645999	11. Related PO No. N/A

12a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 12b) <input checked="" type="checkbox"/> No (NA Blks. 12b, 12c, 12d)	12b. Work Package No. N/A	12c. Modification Work Complete N/A Design Authority/Cog. Engineer Signature & Date	12d. Restored to Original Condition (Temp. or Standby ECN only) N/A Design Authority/Cog. Engineer Signature & Date
---	---------------------------------	---	--

13a. Description of Change Page 34, Section 9.3.1 - Clarification added, paragraph deleted. Page 37, Section 10.2.2 - Clarification added. Page 39, Section 11.3 - Clarification added. Page 40, Section 11.3.1 - Deletions for clarification.	13b. Design Baseline Document? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
--	--

14a. Justification (mark one) Criteria Change <input type="checkbox"/> Design Improvement <input type="checkbox"/> Environmental <input type="checkbox"/> Facility Deactivation <input type="checkbox"/> As-Found <input type="checkbox"/> Facilitate Const <input checked="" type="checkbox"/> Const. Error/Omission <input type="checkbox"/> Design Error/Omission <input type="checkbox"/>

14b. Justification Details Clarification of record submittals required. Design verification of this change was performed and the changes were found not to impact the design basis of the MCO by S. R. Crow. <i>S.R. Crow</i> 7/13/98

15. Distribution (include name, MSIN, and no. of copies) M.A. Butterworth T2-10 B.J. Hug G1-50 K.E. Smith R3-86 S.R. Crow H1-15 G.E. Mata G1-50 J.M. Tanke B6-01 M.D. Evarts N1-29 T.D. Merkling X3-79 J.E. Thomas N1-29 L.H. Goldmann R3-86 E.S. Ruff E6-15 C.E. Getz T2-10 C.R. Hoover H1-15 SNF Project Files R3-11 J. D. Cloud R3-86 J.D. Thomson R3-11 C.B. Loftis S7-41	RELEASE STAMP DATE: STA: 4 JUL 14 1998 ID: 2
---	--

[illegible]